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Tashev et al.

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(54) **PEDESTRIAN ROUTE PRODUCTION**

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G01C 21/00 (2006.01)

(52) **U.S. Cl.** **701/206**; 701/200; 701/201; 701/208; 701/211; 701/213; 340/991; 340/993; 340/990

(58) **Field of Classification Search** 701/200, 701/201, 208, 211, 213; 340/991, 993, 990, 340/995; 364/443, 444, 449
See application file for complete search history.

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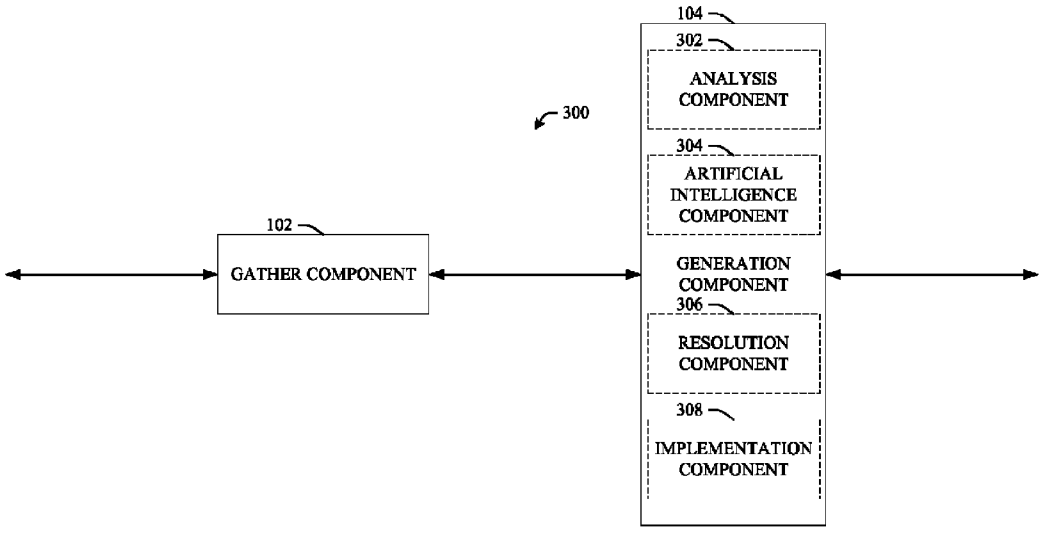
(57) **ABSTRACT**

As a pedestrian travels, various difficulties can be encountered, such as traveling through an unsafe neighborhood or being in an open area that is subject to harsh temperatures. A route can be developed for a person taking into account factors that specifically affect a pedestrian. Moreover, the route can alter as a situation of a user changes; for instance, if a user wants to add a stop along a route.

15 Claims, 10 Drawing Sheets



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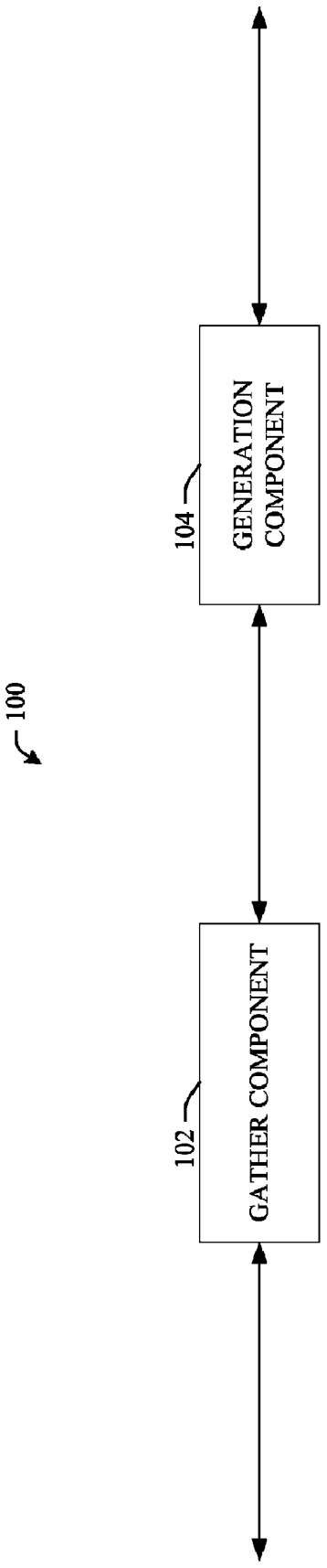

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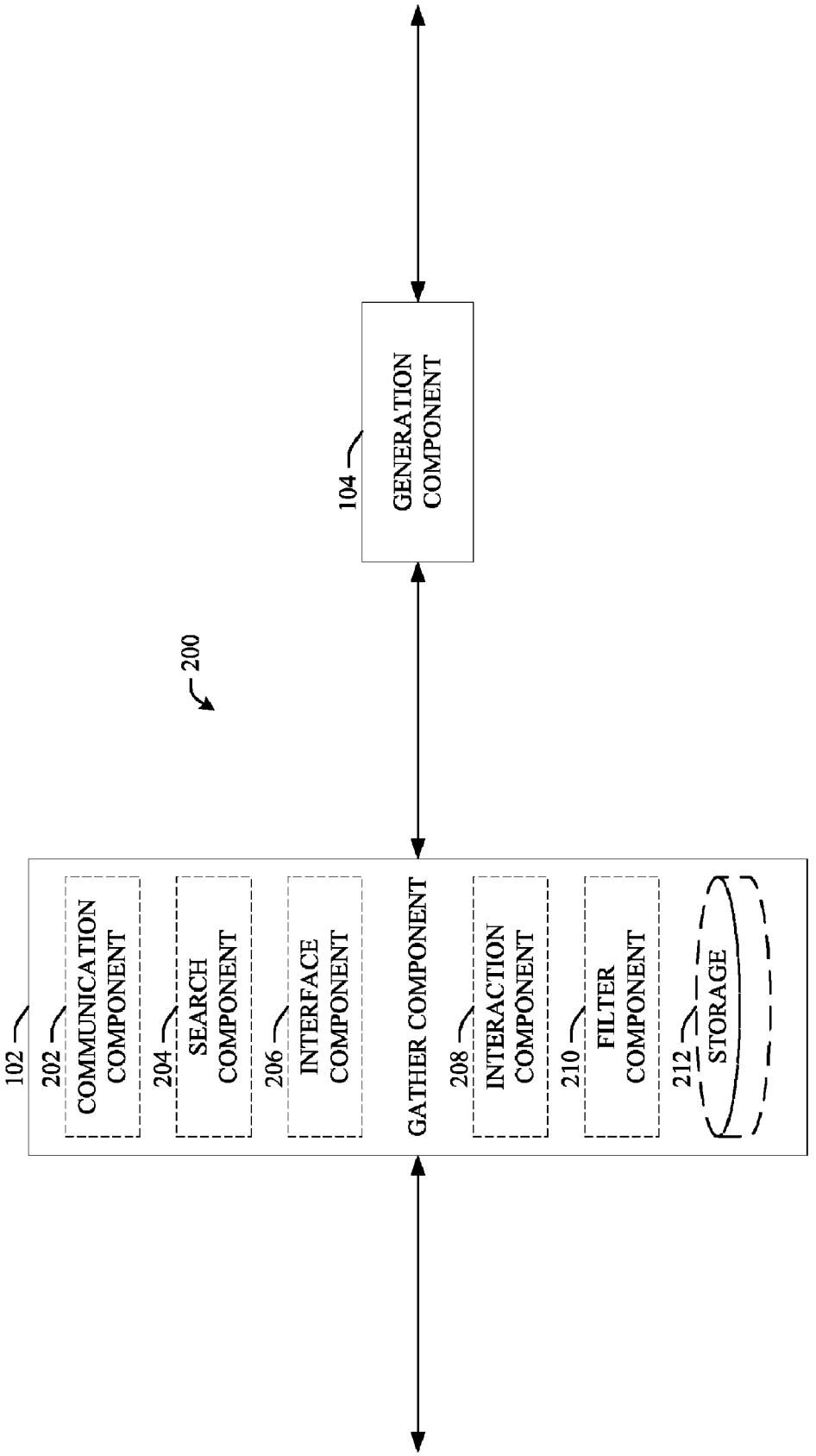
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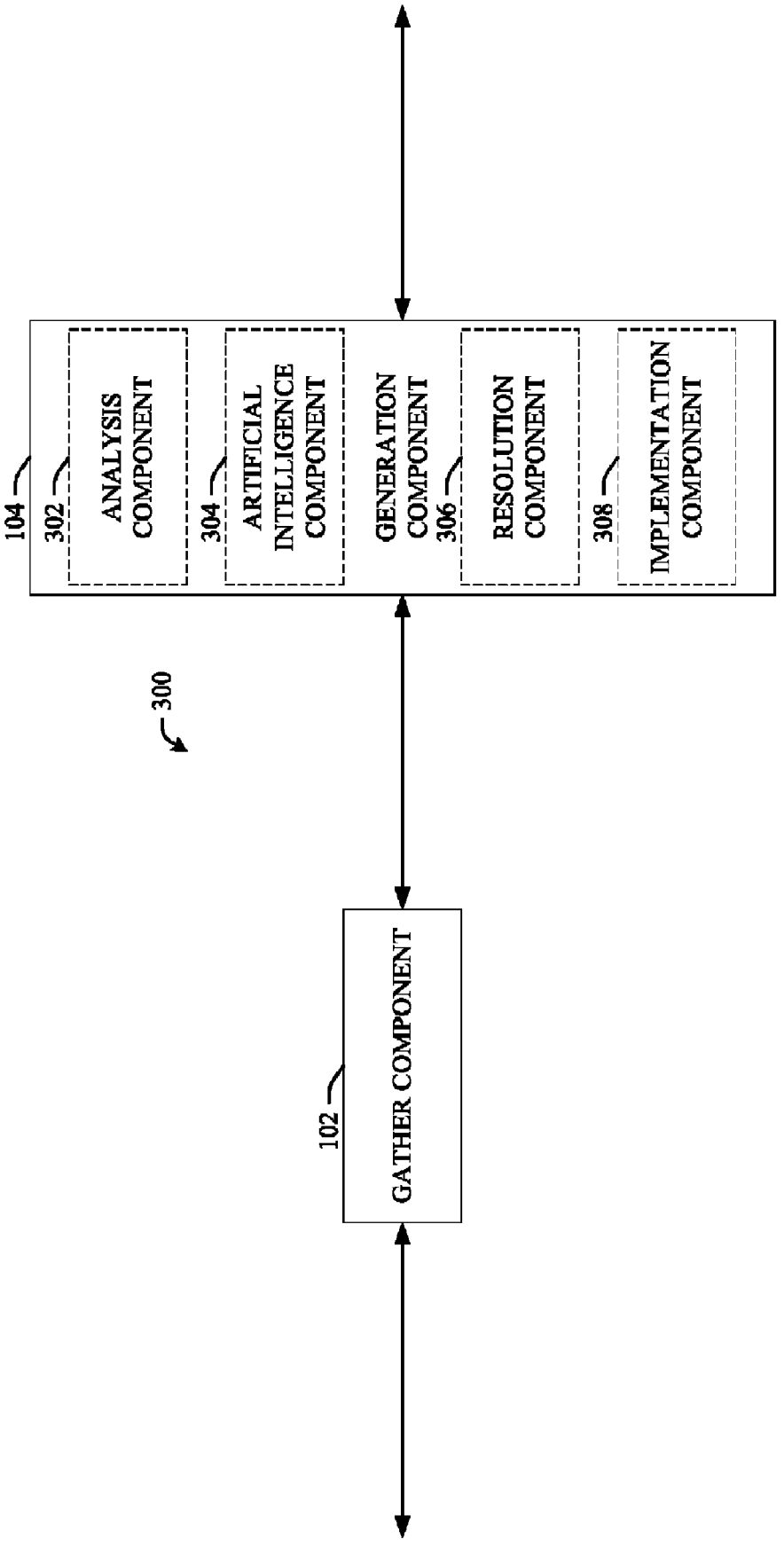
FIG. 2

FIG. 3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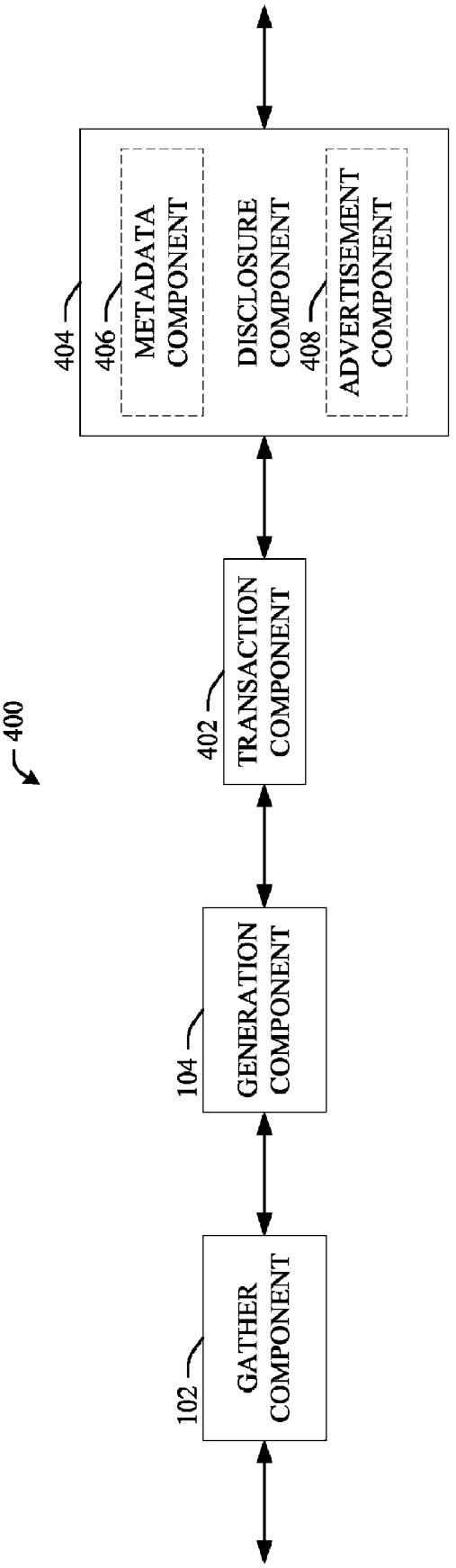
GATHER COMPONENT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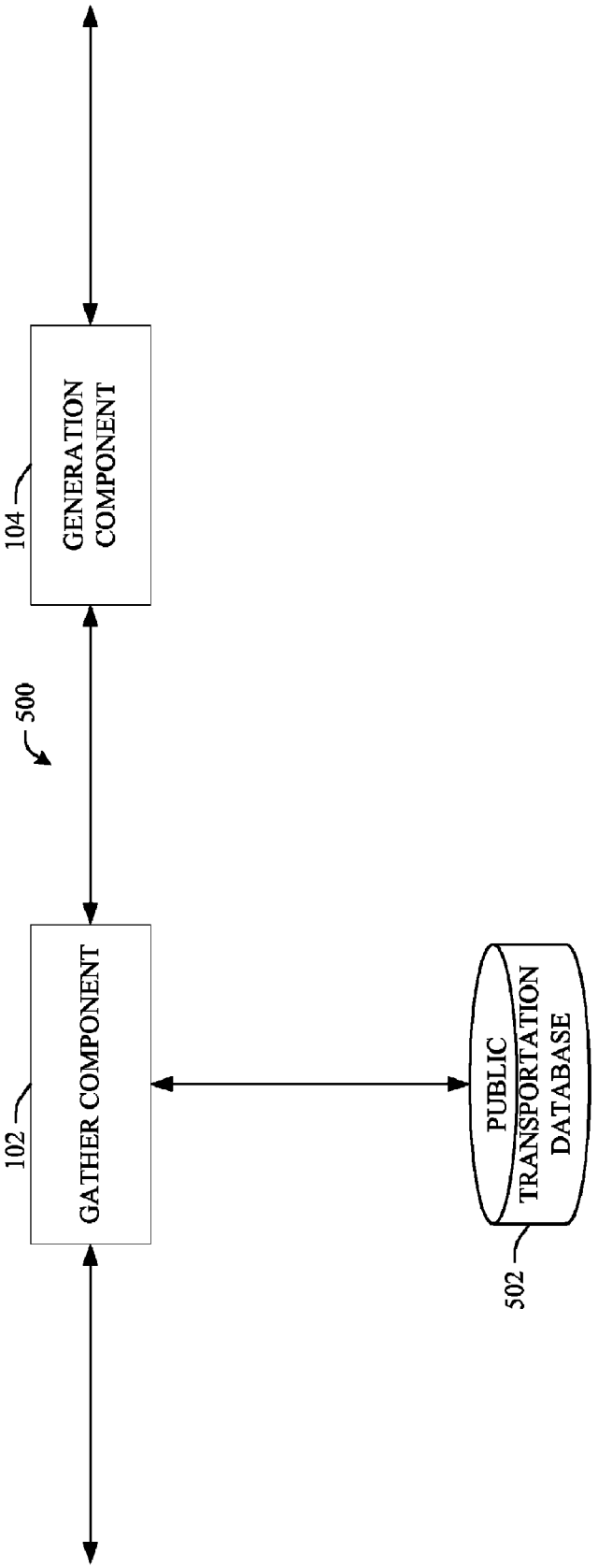
ADVERTISEMENT COMPONENT

FIG. 4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GATHER COMPONENT
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PUBLIC TRANSPORTATION DATABASE
502

FIG. 5

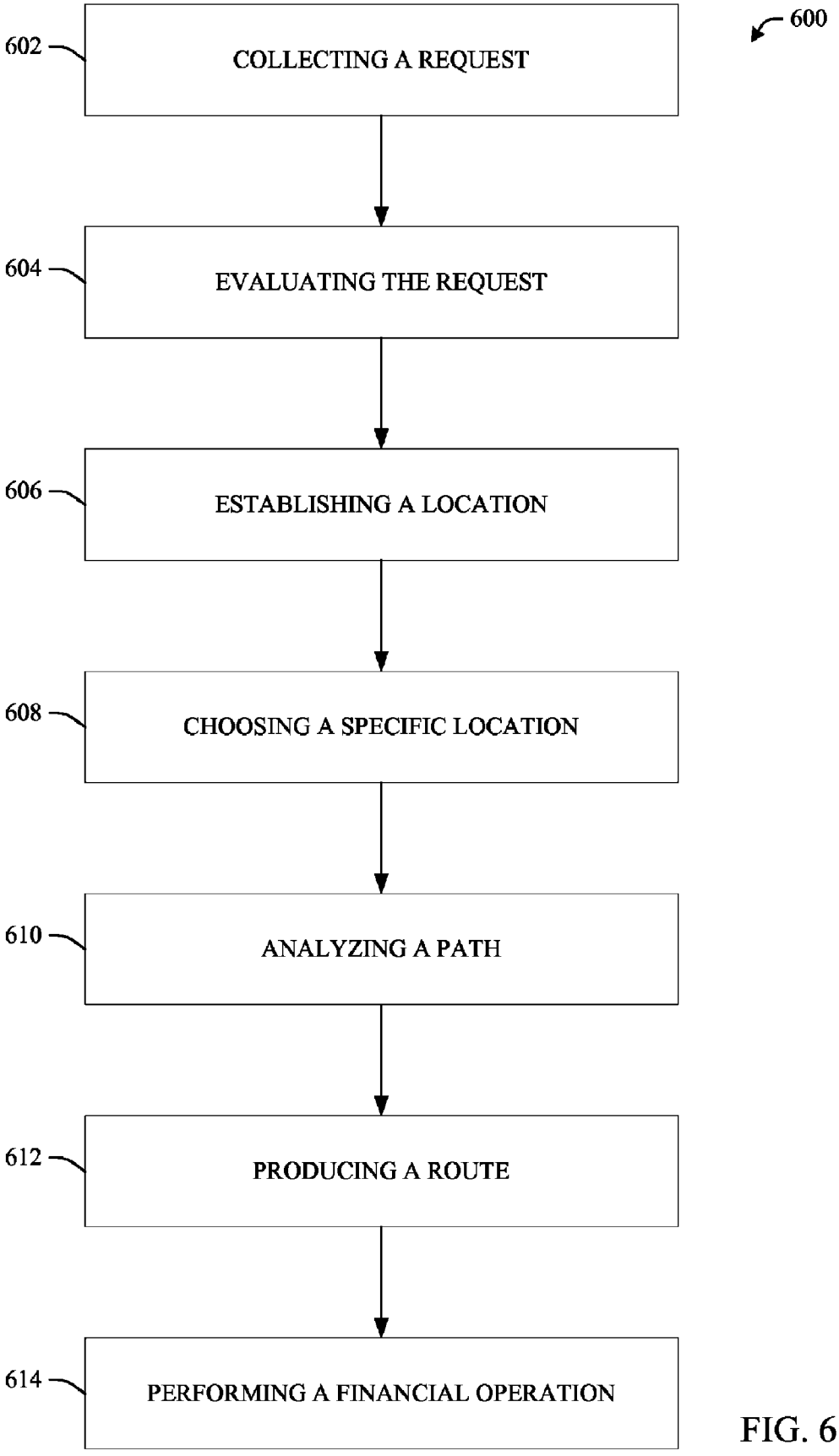
600
602
COLLECTING A REQUEST
604
EVALUATING THE REQUEST
606
ESTABLISHING A LOCATION
608
CHOOSING A SPECIFIC LOCATION
610
ANALYZING A PATH
612
PRODUCING A ROUTE
614
PERFORMING A FINANCIAL OPERATION

FIG. 6

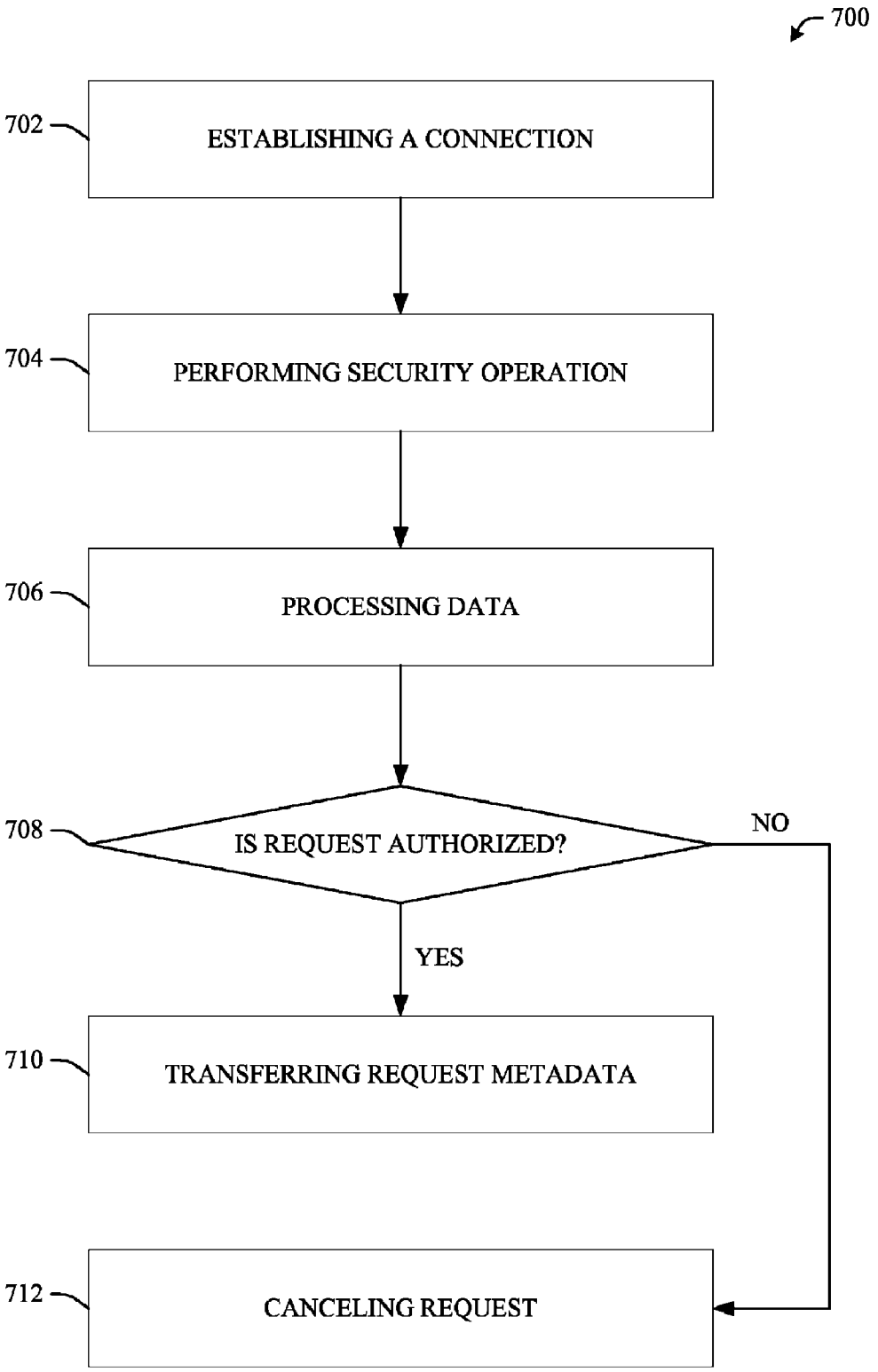
700
702
ESTABLISHING A CONNECTION
704
PERFORMING SECURITY OPERATION
706
PROCESSING DATA
708
IS REQUEST AUTHORIZED?
NO
YES
710
TRANSFERRING REQUEST METADATA
712
CANCELING REQUEST

FIG. 7

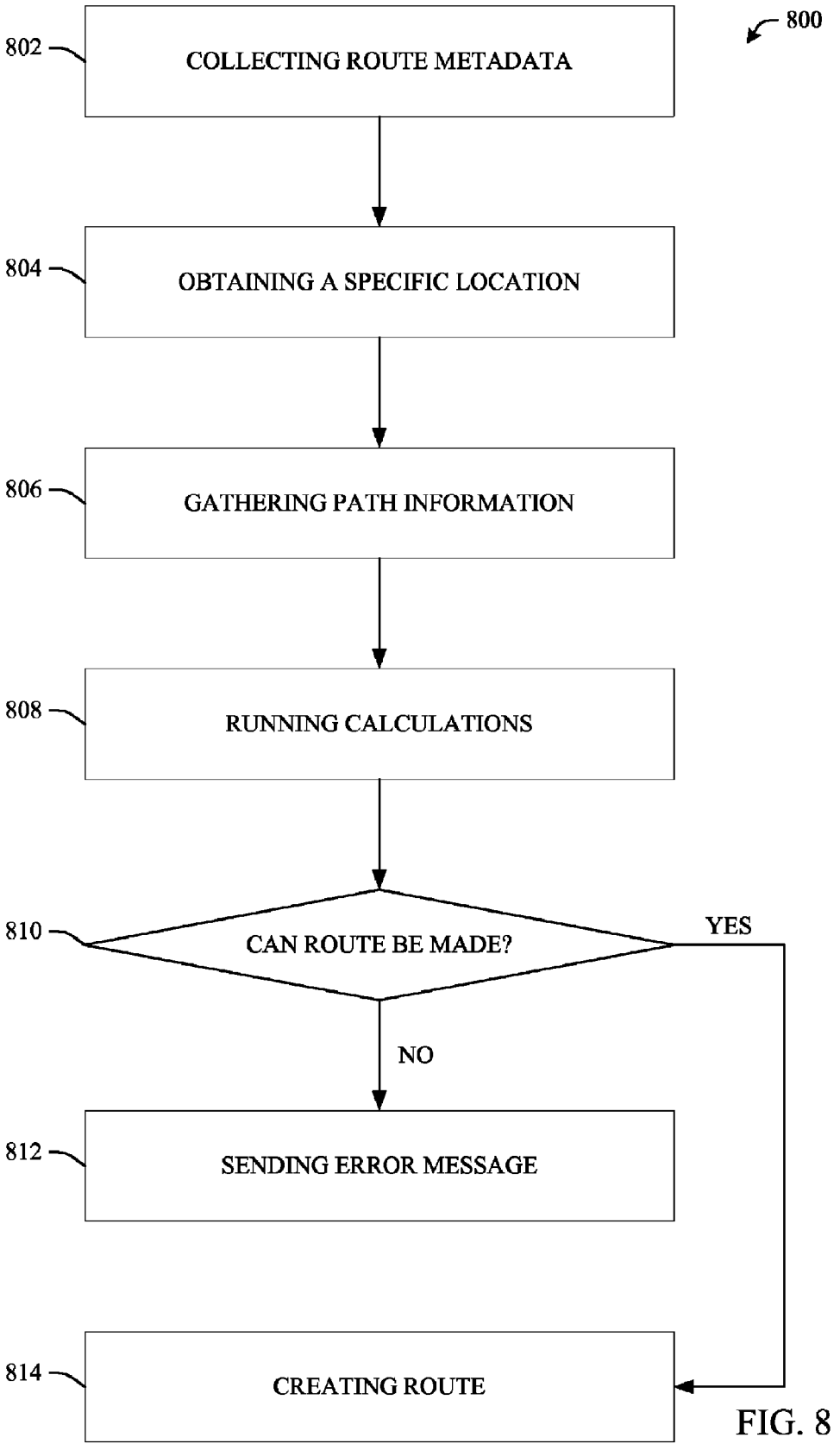
800
802
COLLECTING ROUTE METADATA
804
OBTAINING A SPECIFIC LOCATION
806
GATHERING PATH INFORMATION
808
RUNNING CALCULATIONS
810
CAN ROUTE BE MADE?
YES
NO
812
SENDING ERROR MESSAGE
814
CREATING ROUTE

FIG. 8

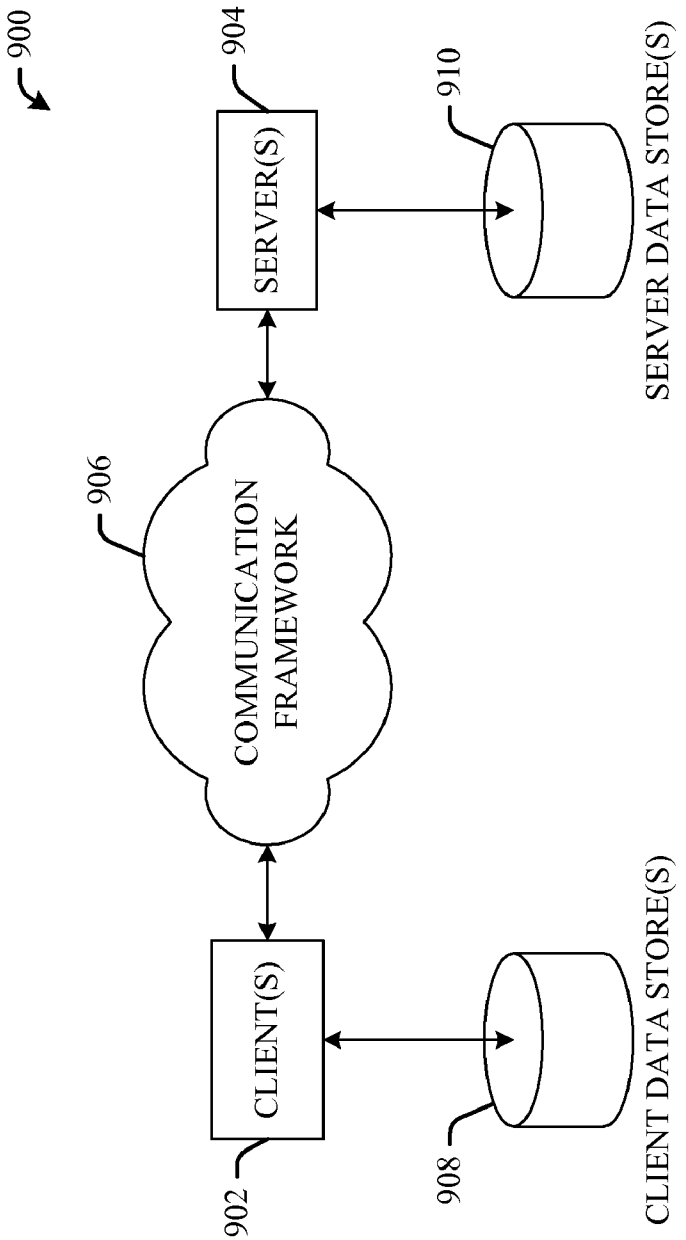
900
904
SERVER(S)
910
SERVER DATA STORE(S)
906
COMMUNICATION FRAMEWORK
CLIENT(S)
902
908
CLIENT DATA STORE(S)

FIG. 9

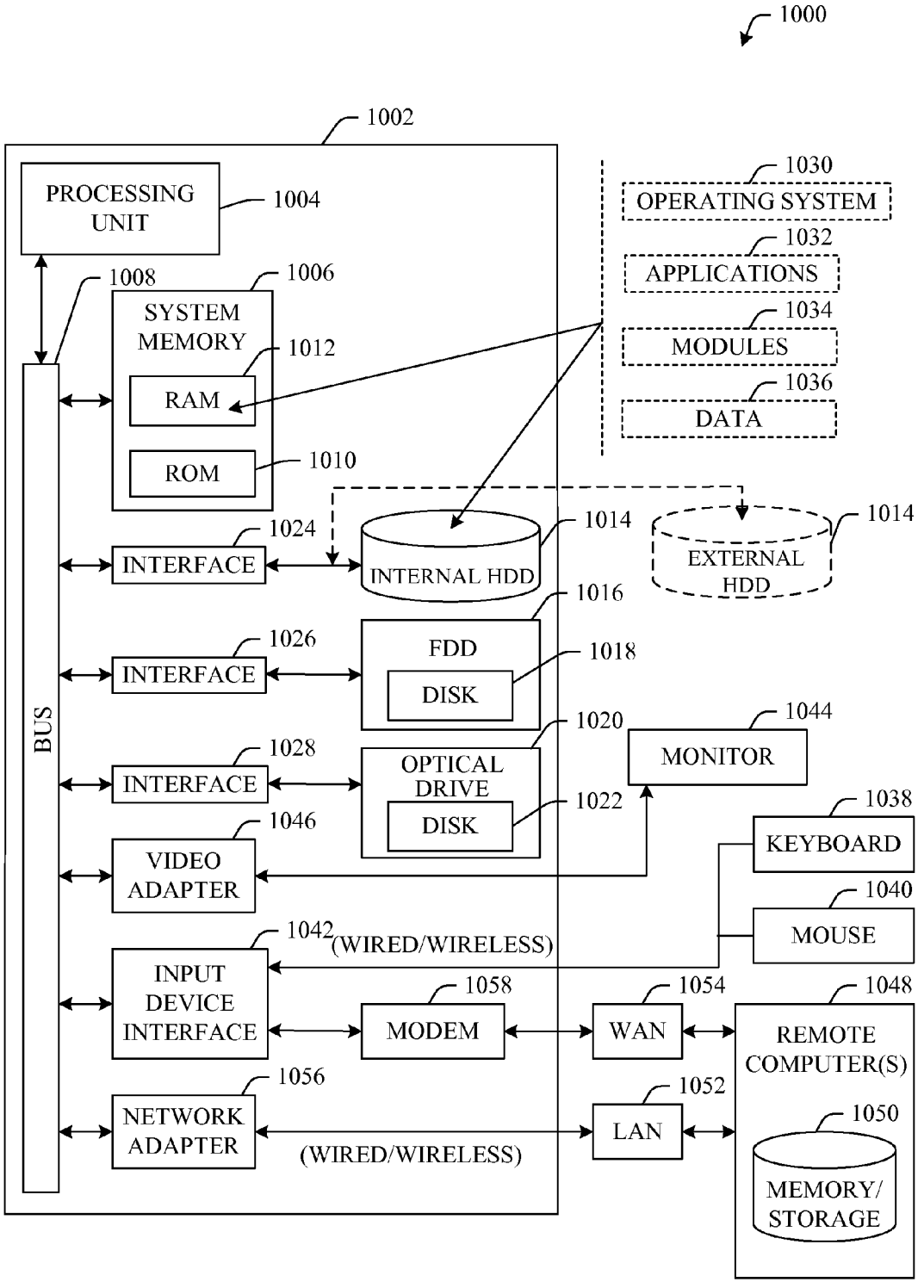
1000
1002
PROCESSING UNIT
1004
SYSTEM MEMORY
1006
1008
1012
RAM
ROM
1010
BUS
1030
OPERATING SYSTEM
1032
APPLICATIONS
1034
MODULES
1036
DATA
1024
INTERFACE
INTERNAL HDD
1014
EXTERNAL HDD
1014
1016
1026
INTERFACE
FDD
DISK
1018
1020
1028
INTERFACE
OPTICAL DRIVE
DISK
1022
1044
MONITOR
1038
KEYBOARD
1046
VIDEO ADAPTER
1040
MOUSE
1042
(WIRED/WIRELESS)
INPUT DEVICE INTERFACE
1058
MODEM
1054
WAN
1048
REMOTE COMPUTER(S)
1056
NETWORK ADAPTER
(WIRED/WIRELESS)
1052
LAN
1050
MEMORY/ STORAGE

FIG. 10

PEDESTRIAN ROUTE PRODUCTION

CROSS-REFERENCE

This application relates to U.S. patent application Ser. No. 11/957,115 entitled "ROUTE MONETIZATION".

This application relates to U.S. patent application Ser. No. 11/957,127 entitled "FEDERATED ROUTE PRODUCTION".

This application relates to U.S. patent application Ser. No. 11/957,139 entitled "DESTINATION AUCTIONED THROUGH BUSINESS OF INTEREST".

This application relates to U.S. patent application Ser. No. 11/957,151 entitled "GENERATIONAL INTELLIGENT NAVIGATION SYNCHRONIZATION OR UPDATE".

This application relates to U.S. patent application Ser. No. 11/957,167 entitled "SOCIAL NETWORK BASED ROUTES".

This application relates to U.S. patent application Ser. No. 11/957,182 entitled "ROUTE TRANSFER BETWEEN DEVICES".

This application relates to U.S. patent application Ser. No. 11/957,188 entitled "ADDITIONAL CONTENT BASED ON INTENDED TRAVEL DESTINATION".

This application relates to U.S. patent application Ser. No. 11/957,206 entitled "AUTOMATIC SPLICES FOR TARGETED ADVERTISEMENTS".

This application relates to U.S. patent application Ser. No. 11/957,219 entitled "ROUTE GENERATION BASED UPON ACTIVITY CRITERIA".

TECHNICAL FIELD

The subject specification relates generally to route production and in particular to route generation for a pedestrian.

BACKGROUND

Computer-driven automobile route planning applications are utilized to aid users in locating points of interest, such as particular buildings, addresses, and the like. Additionally, in several existent commercial applications, users can vary a zoom level, thereby enabling variation of context and detail as a zoom level of a map is altered. For example, as a user zooms in on a particular location, details such as names of local roads, identification and location of police and fire stations, identification and location of public services, such as libraries, museums, and the like can be provided to the user. When zooming out, the user can glean information from the map such as location of the point of interest within a municipality, state/providence, and/or country, proximity of the point of interest to major freeways, proximity of the point of interest to a specific city, and the like.

Furthermore, conventional computer-implemented mapping applications often include automotive route-planning applications that can be utilized to provide users with directions between different locations. Pursuant to an example, a user can provide an automotive route planning application with a beginning point of travel and an end point of travel (e.g., beginning and ending addresses). The route planning application can include or utilize representations of roads and intersections and one or more algorithms to output a suggested route of travel. These algorithms can output routes depending upon user-selected parameters. For instance, a commercial route planning application can include a check box that enables a user to specify that she wishes to avoid highways. Similarly, a user can inform the route planning application that she wishes to travel on a shortest route or a route that takes a least amount of time (as determined by underlying algorithms). Over the last several years, individuals have grown to rely increasingly on route planning applications to aid them in everything from locating a friend's house to planning cross-country road trips.

SUMMARY

The following discloses a simplified summary of the specification in order to provide a basic understanding of some aspects of the specification. This summary is not an extensive overview of the specification. It is intended to neither identify key or critical elements of the specification nor delineate the scope of the specification. Its sole purpose is to disclose some concepts of the specification in a simplified form as a prelude to the more detailed description that is disclosed later.

Conventional route generation systems obtain data from various sources and generate a direction set to be used by a person operating an automobile. A user commonly inputs a starting location and an intended destination in addition to travel constraints (e.g., to avoid highways, minimum travel time, minimal travel distance, or minimal gas consumption); based upon inputted information, a travel route is generated. However, there are numerous difficulties in translating vehicle (e.g., automotive) route generation to pedestrian travel. For instance, a pedestrian can commonly traverse terrain that is more rugged then many vehicles (e.g., climbing steep and rocky hills); conversely, a pedestrian can become more susceptible to environmental influence, such as from cold temperatures.

The disclosed innovation produces routes that are intended to be taken by a pedestrian. A gather component obtains information related to intended pedestrian travel and a generation component produces a route based upon at least part of the obtained information. Commonly, the pedestrian route is produced based off security information, weather information, terrain information, or a combination thereof. Various features can integrate with route presentment, such as integrating an advertisement targeted to a pedestrian with a direction set.

A large amount of focus in route generation has focused upon vehicle route generation and little attention has been paid to pedestrian route production. Since a large number of individuals travel by vehicle, application to pedestrian travel has been ignored. However, there has been a long felt need for route generation towards individuals that do not commonly travel by vehicle—for instance, many economically challenged areas are populated with individuals that do not own motorized vehicles and generally travel by walking. In addition, unexpected results can take place through practice of the disclosed innovation. As an illustration, a pedestrian could arrive at a location faster than if she traveled in a vehicle by taking more direct paths, yet a vehicle commonly travels much faster. Due to detailed route planning, a direction set can be created that allows a user to take more diverse paths that can compensate for a general lack of speed.

The following description and the annexed drawings set forth certain illustrative aspects of the specification. These aspects are indicative, however, of but a few of the various ways in which the principles of the specification can be employed. Other advantages and novel features of the specification will become apparent from the following detailed description of the specification when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** illustrates a representative system for producing a pedestrian-based route in accordance with an aspect of the subject specification.

FIG. **2** illustrates a representative system for producing a pedestrian-based route with a detailed gather component in accordance with an aspect of the subject specification.

FIG. **3** illustrates a representative system for producing a pedestrian-based route with a detailed generation component in accordance with an aspect of the subject specification.

FIG. **4** illustrates a representative system for producing a pedestrian-based route with a transaction component and detailed disclosure component in accordance with an aspect of the subject specification.

FIG. **5** illustrates a representative system for producing a pedestrian-based route in conjunction with use of a public transportation system in accordance with an aspect of the subject specification.

FIG. **6** illustrates a representative methodology for performing actions related to output of a pedestrian-based route in accordance with an aspect of the subject specification.

FIG. **7** illustrates a representative methodology for collecting a request from a user to produce a route with a waypoint in accordance with an aspect of the subject specification.

FIG. **8** illustrates a representative methodology for pedestrian route production in accordance with an aspect of the subject specification.

FIG. **9** illustrates an example of a schematic block diagram of a computing environment in accordance with the subject specification.

FIG. **10** illustrates an example of a block diagram of a computer operable to execute the disclosed architecture.

DETAILED DESCRIPTION

The claimed subject matter is now described with reference to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding of the claimed subject matter. It can be evident, however, that the claimed subject matter can be practiced without these specific details. In other instances, well-known structures and devices are shown in block diagram form in order to facilitate describing the claimed subject matter.

As used in this application, the terms "component," "module," "system," "interface," or the like are generally intended to refer to a computer-related entity, either hardware, a combination of hardware and software, software, or software in execution. For example, a component can be, but is not limited to being, a process running on a processor, a processor, an object, an executable, a thread of execution, a program, and/or a computer. By way of illustration, both an application running on a controller and the controller can be a component. One or more components can reside within a process and/or thread of execution and a component can be localized on one computer and/or distributed between two or more computers. As another example, an interface can include I/O components as well as associated processor, application, and/or API components.

Furthermore, the claimed subject matter can be implemented as a method, apparatus, or article of manufacture using standard programming and/or engineering techniques to produce software, firmware, hardware, or any combination thereof to control a computer to implement the disclosed subject matter. The term "article of manufacture" as used herein is intended to encompass a computer program accessible from any computer-readable device, carrier, or media. For example, computer readable media can include but are not limited to magnetic storage devices (e.g., hard disk, floppy disk, magnetic strips . . .), optical disks (e.g., compact disk (CD), digital versatile disk (DVD) . . .), smart cards, and flash memory devices (e.g., card, stick, key drive . . .). Additionally it should be appreciated that a carrier wave can be employed to carry computer-readable electronic data such as those used in transmitting and receiving electronic mail or in accessing a network such as the Internet or a local area network (LAN). Of course, those skilled in the art will recognize many modifications can be made to this configuration without departing from the scope or spirit of the claimed subject matter.

Moreover, the word "exemplary" is used herein to mean serving as an example, instance, or illustration. Any aspect or design described herein as "exemplary" is not necessarily to be construed as preferred or advantageous over other aspects or designs. Rather, use of the word exemplary is intended to disclose concepts in a concrete fashion. As used in this application, the term "or" is intended to mean an inclusive "or" rather than an exclusive "or". That is, unless specified otherwise, or clear from context, "X employs A or B" is intended to mean any of the natural inclusive permutations. That is, if X employs A; X employs B; or X employs both A and B, then "X employs A or B" is satisfied under any of the foregoing instances. In addition, the articles "a" and "an" as used in this application and the appended claims should generally be construed to mean "one or more" unless specified otherwise or clear from context to be directed to a singular form. It is to be appreciated that various determinations or inferences made in the subject specification can be practiced through use of artificial intelligence techniques.

Now referring to FIG. **1**, an example system **100** is disclosed for producing a travel route for a pedestrian. Various route production systems are available for a user traveling though utilization of a vehicle. However, a pedestrian (e.g., a person traveling in a natural manner, such as walking, swimming, climbing, etc., an individual functioning as a passenger, a person riding along an escalator or elevator, controlling/riding in a wheelchair, and the like) can have specific characteristics that are different from what is considered in vehicle route planning. For example, when a user travels as a pedestrian, she is commonly more exposed environmental elements. If it is relatively cold outside, then a pedestrian is far more likely to feel an impact then if a vehicle equipped with a heating system protected her. Moreover, it can be more dangerous for a pedestrian to enter an unsafe neighborhood then a person in a vehicle since a pedestrian is more exposed and it is more difficult for her to leave an unsafe neighborhood quickly. However, there are advantages to being a pedestrian traveler; if a pedestrian takes an incorrect action (e.g., turns down a wrong street), then correction can be easier since there are commonly fewer one-way pedestrian streets.

The system **100** can produce a direction set that is specifically tailored to pedestrian travel. A gather component **102** can obtain information related to pedestrian travel. Example information related to pedestrian travel include maps (e.g., extracted from a database), user history, weather information, crime statistics, demographic information, etc. Various processing can take place upon the obtained information, such as ranking obtained information toward relevance in pedestrian route production.

Obtained information and metadata (e.g., ranking results) can transfer from the gather component **102** to a generation component **104** that produces a direction set for use by a

pedestrian based at least part upon the obtained information. Obtained information can be analyzed and analysis results are used to create a new travel route or modify an existing travel route. The produced direction set can be outputted to a user device, such as a cellular telephone, personal digital assistant, watch, dedicated vehicle device, printer etc. The produced direction set can be improved or optimized according to at least one criterion, such as keeping a user safe.

The following is an illustrative example of operation of the system **100** according to an aspect of the subject specification. Historically, at 5 PM, a user can walk from his office to his home on weekdays; the gather component **102** can learn this history and obtain information related to the walk (e.g., paths previously taken by a user, available paths, user experiences upon the paths, etc.). For instance, the gather component **102** can extract information from a schedule that the user is to attend his daughter's recital in several hours, so it is likely he wants a quickest path. The generation component **104** can analyze the information and construct a direction set that allows the user to take paths that take him to his home in a quickest amount of time while keeping the user relatively safe (e.g., taking the user through neighborhoods with violent crime statistics below a certain threshold).

Now referring to FIG. **2**, an example system **200** is disclosed for producing a pedestrian-based route with a representative detailed gather component **102**. The gather component **102** collects information from various sources that can be used to create a pedestrian route. A communication component **202** can engage with other devices to transfer information, such as to send a request for information, receiving information from an auxiliary source, etc. Operation can take place wirelessly, in a hard-wired manner, employment of security technology (e.g., authentication and/or encryption), etc. Moreover, the communication component **202** can utilize various protective features, such as performing a virus scan on obtained data and blocking information that is positive for a virus.

To engage a source (e.g., auxiliary source), a search component **204** can be employed to locate a source that provides information that can be obtained. A source can be a database server, an airway transmission, in incoming electronic message, etc. The search component **204** can retain addresses (e.g., Internet Protocol addresses) of locations that have a history of providing quality information. Moreover, the search component **204** can identify low quality sources (e.g., sources that do not provide much information that is used in route generation) and block information obtainment for such identified sources. The search component **204** can function to extract information from a source, make a copy of information, etc. In addition, information from a plurality of pedestrians (e.g., pedestrian history) can be retained upon a server and extracted though use of the search component **204**.

In addition to extracting information from auxiliary sources, an interface component **206** enables a user to input information that can be used in route production. Common data inputted by a user includes a starting location, constraints (e.g., not to travel over unpaved terrain), intended destination, and the like. The user can enter information in a number of different manners, such as through a keyboard, mouse, stylus, tablet computer, microphone, etc.

In one aspect, a pedestrian can have a desire to engage a particular person or group of people. For example, the system **200** can be on an electronic device of a small child that has become lost from her parents. An interaction component **208** can collect information concerning routes of other people and collected data can be used to update a route in real-time, such as for the child to meet with her parents. The interaction component **208** can be bidirectional, meaning it can collect route or location information of others (e.g., pedestrians, in vehicles, etc.) as well as transmit collected data or direction set information to others (e.g., global transmission, directed transmission, etc.). Based upon this routes can be produced upon multiple devices that lead to a common meeting point.

The gather component **102** can obtain virtually any type of information that relates to pedestrian travel—so much information that operation of the system **200** can lose performance due to tasks associated with processing the information. A filter component **210** can limit information that passes through to a generation component **104** that constructs a direction set. The filter component **210** can determine information that is likely relevant and delete information that is commonly of little value; this can be done at least in part through examination of previously produced routes.

Different pieces of information, such as obtained information, component operating instructions (e.g., of the search component **204**), source location, an original route, etc. can be held on storage **212**. Storage **212** can arrange in a number of different configurations, including as random access memory, battery-backed memory, hard disk, magnetic tape, etc. Various features can be implemented upon storage **212**, such as compression and automatic back up (e.g., use of a Redundant Array of Independent Drives configuration).

Now referring to FIG. **3**, an example system **300** is disclosed for producing a pedestrian route with a detailed generation component **104**. A gather component **102** can obtain information related to pedestrian travel; a generation component **104** can produce a direction set for use by a pedestrian based at least part upon the obtained information. A substantial portion of the directions set can take a user along a route that is not maneuverable by an automobile (e.g., sidewalks, indoor structures, rugged terrain, etc.). For instance, a direction set takes a user along sidewalks and occasionally the user crosses a street that can be traversed by an automobile.

Various characteristics of obtained information can be appreciated through evaluation of obtained information. An analysis component **302** evaluates the obtained information, the evaluation results are used by the generation component **104** to produce the direction set. Evaluating can include determining importance of information to a user (e.g., has a user historically cared about safe neighborhoods), estimating how likely information is to change (e.g., sidewalk congestion), etc. Additionally, the analysis component **302** can choose if a user should reach a destination through a pedestrian route and/or through a conventional route (e.g., a route intended to be traveled by an automobile where the user is a driver). For example, a user can be traveling to a downtown area to watch a baseball game where the user has an option to take public transportation or to drive to the game. The analysis component **302** can process different factors, such as cost of public transportation against cost of parking, and determine if a pedestrian route or other route should be produced.

An artificial intelligence component **304** can make at least one inference or at least one determination in relation to information obtainment or direction set production. For instance, the artificial intelligence component **304** can infer if a user will find a route enjoyable due to previous behavior (e.g., the user walked briskly, the user stopped presumably to view a scenic area or point of interest, etc.) and a route is produced based upon the inference. Moreover, the artificial intelligence component **304** can determine a format a pedestrian would like to receive a direction set. For example, a blind pedestrian can prefer to have a direction set verbally read or printed in Braille and the artificial intelligence component **304** can determine the preference.

Artificial intelligence component **304** can employ one of numerous methodologies for learning from data and then drawing inferences and/or making determinations related to applying a service (e.g., Hidden Markov Models (HMMs) and related prototypical dependency models, more general probabilistic graphical models, such as Bayesian networks, e.g., created by structure search using a Bayesian model score or approximation, linear classifiers, such as support vector machines (SVMs), non-linear classifiers, such as methods referred to as "neural network" methodologies, fuzzy logic methodologies, and other approaches that perform data fusion, etc.) in accordance with implementing various automated aspects described herein. Methods also include methods for the capture of logical relationships such as theorem provers or more heuristic rule-based expert systems.

A resolution component **306** can be used to settle conflicts between different pieces of information where conflicting details are provided. For instance, a news channel can report that there is heavy pedestrian traffic along a sidewalk while a store can publish information that few people are passing the store and offer incentives for routes to direct a user past the store. Since the store has a financial interest in sidewalk traffic, store information can be considered less reliable and the resolution component **306** can instruct the generation component **104** to build a route based upon the news information. Decisions concerning direction set production can be placed into effect by an implementation component **308**. Common implementations include building a new direction set, altering a direction set, and the like. Consistency checks can be run by the implementation component **308**, such as if multiple goals of a user are met (e.g., a user wants to take a fastest route and stop to buy lunch; however, there is not a store selling food along a fastest route). If a check fails, then the generation component **104** can modify the route before it is produced.

Now referring to FIG. **4**, an example system **400** is disclosed for producing a pedestrian route with a transaction component **402** and a disclosure component **404**. A gather component **102** can obtain information related to pedestrian travel; a generation component **104** can produce a direction set for use by a pedestrian based at least part upon the obtained information. Production of the direction set can be based upon security information (e.g., avoiding unsafe neighborhoods), weather information (e.g., having a user travel indoors when rain is expected or taking place), terrain information (e.g., avoiding non-paved roads for an elderly pedestrian), or a combination thereof.

Various actions take place in accordance with direction set production, such as information passing between different parties. Rewards (e.g., money) can be exchanged between parties, accounts, etc. through used of a transaction component **402**. The transaction component **402** can perform a reward (e.g., financial, non-financial, etc.) operation in relation to information obtainment or direction set production. The transaction component **402** can perform actions to meet constraints, such as debiting a user account and crediting a provider account. While fiscal amounts are commonly transacted, it is to be appreciated that other commodities can be exchanged, such as coupons, meeting of contractual obligations (e.g., canceling of a task to be performed), tax credits, etc.

Moreover, a reward operation can take place in relation to user response to a commercial detail (e.g., presented with a pedestrian route). For example, an advertisement can be played that a user should stop at a highway exit for a cup of coffee. If the user takes the exit, buys the cup of coffee, buys a different item, etc., then payments of varying amounts can be made to an advertisement hosting service.

A disclosure component **404** can provide the direction set to the pedestrian. A non-exhaustive list of disclosure components include a display screen, touch screen, speaker system, virtual reality environment, Braille production system, printer, etc. In addition, the disclosure component **404** can present information in multiple formats, such as showing a video with audio capabilities. In addition, a variety of components can operate in conjunction with the disclosure component as well as independently.

A metadata component **406** can modify information provided with the direction set based upon contextual information (e.g., a user appears to be in a hurry), pedestrian request (e.g., a user asking to not take a particular route, a fastest way, a shortest way, . . .), pedestrian history (e.g., a user has shown a propensity to avoid particular areas), or a combination thereof. The contextual information, pedestrian request, pedestrian history, or a combination thereof can be obtained by the gather component **102**. Moreover, the disclosure component **404** can provide the direction set with modified information to the pedestrian. The metadata component **406** can operate prior to a pedestrian being presented a direction set as well as modify an already presented direction set. In an illustrative example, a user can have a history of becoming confused and lost in subway systems. The metadata component **406** can add information to a route when a user enters a subway system (e.g., normally sign names are given with a direction set; however, in subways sign names and colors are given.)

In addition to information concerning a route being presented to a pedestrian, an advertisement component **408** can integrate a commercial detail with a direction set. A non-exhaustive list of commercial details can include advertisements of a product or service, coupon, movie preview, etc. For example, a notice can be included in a direction set that a pedestrian can take slight detour and stop at a favorite place to receive coffee. The user can be compensated (e.g., financially) for being presented a commercial detail and a direction set can be altered to take a user to a location related to a commercial detail.

Now referring to FIG. **5**, an example system **500** is shown that produces a pedestrian-based route that enables a pedestrian to take advantage of public transportation and integrated usage of public transportation in a direction set. A gather component **102** can obtain information related to pedestrian travel; thus, the gather component **102** can operate as a means for collecting information related to travel.

A generation component **104** can produce a direction set for use by a pedestrian based at least part upon the obtained information. The generation component **104** can implement as a means for outputting a direction set based upon at least part of the obtained information, the direction set includes a portion where a user travels in a natural manner (e.g., such as walking, swimming, climbing, using a manner appropriate for a disability, such as riding in a wheelchair that is hand powered or electronic, etc.) and a portion where the user functions as a passenger (e.g., traveler in a vehicle, operator of a vehicle/bicycle, etc.). The system **500** can configure such that at least part of the portion where the user functions as a passenger employs the user being a passenger upon public transportation (e.g., public system, private commercial system for movement of at least one person, etc.). For example, a route can have portions where a user walks, drives a motorcycle, and is a passenger in a taxi. The route does not have to

specify a vehicle to be used, such as a route taking a user to a bus stop, where the user can become a passenger on a bus or obtain a taxi ride.

A public transportation database **502** can be used to provide information concerning public transportation. Example information includes routes, schedules, estimated vehicle population density, vehicle metadata (e.g., is a particular bus running on time), etc. A non-exhaustive list of public transportation implementations can include airlines, buses, trains, taxi services, rickshaws, ferries, escalators, elevators, automotive pools, shared rides, multiple-person bicycles, and the like. In one example, a route can be produced by the generation component **104** that has a user walk from her home to her car, drive to an airport parking deck, walk from the parking deck to an airplane, ride the airplane, walk to meet a taxi, take the taxi to a hotel, and walk to a hotel counter.

Now referring to FIG. **6**, an example methodology **600** is disclosed for performing actions towards a pedestrian-based route. At action **602**, a request is collected that a route takes a user to a location, such as a coffee shop (e.g., any coffee shop, a type of coffee shop, a specific shop, etc.). A coffee shop example is used throughout the methodology **600** to highlight various aspects. For instance, a user can send a text message to a friend that he would like to go to a coffee shop and the methodology **600** can extract a request from the text message; however, a request can be a direct appeal from a user.

At event **604**, a request produced by a user can be evaluated. The methodology **600** can read the text message and infer that a route should be altered taking a user to a coffee shop. Additional information can be ascertained relating to a request—for instance a pedestrian can request that a coffee shop be integrated into a route immediately (e.g., make a stop as soon as possible) or integration to take place at anytime along a route.

A search can be performed of relevant localities within an area (e.g., city limits) at act **606**. The search can be specific or general—for any coffee shop, for a coffee shop within a certain distance, for a specific coffee shop chain, etc. A search can be localized (e.g., searching a database for locations) as well as broad (e.g., attempting to communicate with nearby coffee shops) and other implementations.

Based upon locations established at action **606**, a specific location can be chosen at act **608** (e.g., selecting one coffee shop to integrate upon a route from several located coffee shops). Various criteria can be used to select a specific location ranging from user criteria as well as contextual reasons. For instance, different coffee shops can offer different coupons for a user to stop at a shop. User history can be evaluated to infer a coupon that would be most beneficial to a user (e.g., a coupon on a user's favorite coffee drink) and evaluation results can be used to select a location.

At act **610**, a database of paths can be analyzed in order to determine how a pedestrian can reach a specific location as well as reach an intended destination from the specific location. In order for a pedestrian to reach a selected location, paths are taken to connect a user location to a route. A path database can be analyzed to determine pedestrian friendly paths that can be taken. In addition to available paths, metadata can be gained, such as safety of paths, expected traffic, path views (e.g., if a user is a tourist, then she can desire to travel along routes that are considered more scenic or more historical), and the like.

A pedestrian based route can be produced that can include travel to a specific location at action **612**. Commonly, the produced route is outputted to a user through a disclosure device. According to one embodiment, a considerable portion of the route takes the pedestrian along at least one path that is not maneuverable by an automobile. Moreover, the produced route can be based upon security information, weather information, terrain information, or a combination thereof. It is to be appreciated that action **602** can configure to follow directly into action **612** without act **606**, **608**, or **610**.

At block **614**, a financial transaction can take place in accordance with the methodology **600**. Money can be exchanged between parties due to functions of the methodology **600**. For instance, if a particular coffee shop is selected, then the coffee shop can be obliged to pay a company running the methodology **600** for the selection. Money can be debited from an account of the coffee shop and credited to a user account. While money is discussed, it is to be appreciated non-monetary rewards can change between parties.

Now referring to FIG. **7**, an example methodology **700** is disclosed for collecting a request from a pedestrian that a route includes a waypoint (e.g., a non-final stop, a destination, etc.) to a general location such as action **602** of FIG. **6**. Commonly, a generation location is a type of location, such as a coffee shop; however, it can be a coffee shop of a certain company, a particular shop (e.g., the coffee shop on 'Main Street'), etc. A connection can be established (e.g., electronic coupling) between a user input interface and a processor that allows for a request to be communicated at event **702**.

A request can include harmful characteristics, such as viruses, and operations to prevent damage can take place at action **704**. A scan can take place upon an incoming request and safety measures can be implemented, such a quarantining dangerous data. If dangerous data is discovered, then a message can be sent that a supplemental request should be made. Security operation can include authentication for authorizing access to restricted areas.

At block **706**, data can be processed related to the request to ascertain characteristics of the request. Processing request data, such as learning a time a request was made, enables specific actions to take place based upon the request. Information learned from the processing can be retained in storage.

A check **708** takes place to determine if a request is authorized. For instance, a pedestrian can travel upon a military base where access at many areas is restricted. If a pedestrian requests that a waypoint be included that takes the pedestrian to a munitions depot, then the check **708** can determine if the pedestrian is allowed to receive information concerning a depot.

If a request is authorized, then request metadata can be transferred at act **710**. Commonly, the information is transferred to a location that can perform production of a pedestrian-based route. An unauthorized request can lead to request cancellation at event **712** and a message can be sent to a requesting party stating that a request was denied. In an alternative embodiment, while a request is authorized, it can be possible that a request cannot be complied (e.g., a location requested does not exist). A message can be transferred to a user stating that a request cannot be followed as well as why it is not being followed.

Now referring to FIG. **8**, an example methodology **800** is disclosed for producing a pedestrian-based route that includes a waypoint to a specific location, based upon the collected request, such as action **612** of FIG. **6**. According to one embodiment, route metadata can be collected at event **802** when a route exists and is to be modified. However, it is to be appreciated that a route can be created without used of a previous route. Specific location data, such as a coffee shop to be visited, can be obtained at event **804**, which can originate from action **606** of FIG. **6**. Moreover, at action **806**, path information is gathered, commonly originating from a map.

A variety of calculations can take place in accordance with the methodology **800** at event **808**. For instance, multiple locations can be chosen and event **808** selects a best location base upon user interest, convenience, etc. In addition, calculations can be performed that discover a path that can take a user to a specific location (e.g., at least on path from a current location to a specific location). Multiple routes can be established and weighted against one another to determine a route that should be presented to a user.

A check **810** can take place to determine if a route can be made that includes the specific location. For example, a user can request to go to restaurant chain that is out of business, therefore a route cannot be created. The check **810** can determine if a route can be made in general as well as if a route can be realistically made. For instance, if a nearest requested location is several hundred miles away, then it can be considered unrealistic for a pedestrian to travel such a long distance.

If no route can be made (e.g., reasonably be made), then an error message can be sent at block **812**. The error message can be interactive, such as asking a user if she would like to make another request. At event **814**, if a route can be made, then an appropriate route is created. Creation of a route can include building a new route as well as modifying an existing route.

For purposes of simplicity of explanation, methodologies that can be implemented in accordance with the disclosed subject matter were shown and described as a series of blocks. However, it is to be understood and appreciated that the claimed subject matter is not limited by the order of the blocks, as some blocks can occur in different orders and/or concurrently with other blocks from what is depicted and described herein. Moreover, not all illustrated blocks can be required to implement the methodologies described hereinafter. Additionally, it should be further appreciated that the methodologies disclosed throughout this specification are capable of being stored on an article of manufacture to facilitate transporting and transferring such methodologies to computers. The term article of manufacture, as used, is intended to encompass a computer program accessible from any computer-readable device, carrier, or media.

In order to provide a context for the various aspects of the disclosed subject matter, FIGS. **9** and **10** as well as the following discussion are intended to provide a brief, general description of a suitable environment in which the various aspects of the disclosed subject matter can be implemented. While the subject matter has been described above in the general context of computer-executable instructions of a program that runs on one or more computers, those skilled in the art will recognize that the subject matter described herein also can be implemented in combination with other program modules. Generally, program modules include routines, programs, components, data structures, etc. that perform particular tasks and/or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the inventive methods can be practiced with other computer system configurations, including single-processor, multiprocessor or multi-core processor computer systems, mini-computing devices, mainframe computers, as well as personal computers, hand-held computing devices (e.g., personal digital assistant (PDA), phone, watch . . .), microprocessor-based or programmable consumer or industrial electronics, and the like. The illustrated aspects can also be practiced in distributed computing environments where tasks are performed by remote processing devices that are linked through a communications network. However, some, if not all aspects of the claimed subject matter can be practiced on stand-alone computers. In a distributed computing environment, program modules can be located in both local and remote memory storage devices.

Referring now to FIG. **9**, there is illustrated a schematic block diagram of a computing environment **900** in accordance with the subject specification. The system **900** includes one or more client(s) **902**. The client(s) **902** can be hardware and/or software (e.g., threads, processes, computing devices). The client(s) **902** can house cookie(s) and/or associated contextual information by employing the specification, for example.

The system **900** also includes one or more server(s) **904**. The server(s) **904** can also be hardware and/or software (e.g., threads, processes, computing devices). The servers **904** can house threads to perform transformations by employing the specification, for example. One possible communication between a client **902** and a server **904** can be in the form of a data packet adapted to be transmitted between two or more computer processes. The data packet can include a cookie and/or associated contextual information, for example. The system **900** includes a communication framework **906** (e.g., a global communication network such as the Internet) that can be employed to facilitate communications between the client(s) **902** and the server(s) **904**.

Communications can be facilitated via a wired (including optical fiber) and/or wireless technology. The client(s) **902** are operatively connected to one or more client data store(s) **908** that can be employed to store information local to the client(s) **902** (e.g., cookie(s) and/or associated contextual information). Similarly, the server(s) **904** are operatively connected to one or more server data store(s) **910** that can be employed to store information local to the servers **904**.

Referring now to FIG. **10**, there is illustrated a block diagram of a computer operable to execute the disclosed architecture. In order to provide additional context for various aspects of the subject specification, FIG. **10** and the following discussion are intended to provide a brief, general description of a suitable computing environment **1000** in which the various aspects of the specification can be implemented. While the specification has been described above in the general context of computer-executable instructions that can run on one or more computers, those skilled in the art will recognize that the specification also can be implemented in combination with other program modules and/or as a combination of hardware and software.

Generally, program modules include routines, programs, components, data structures, etc., that perform particular tasks or implement particular abstract data types. Moreover, those skilled in the art will appreciate that the inventive methods can be practiced with other computer system configurations, including single-processor or multiprocessor computer systems, minicomputers, mainframe computers, as well as personal computers, hand-held computing devices, microprocessor-based or programmable consumer electronics, and the like, each of which can be operatively coupled to one or more associated devices.

The illustrated aspects of the specification can also be practiced in distributed computing environments where certain tasks are performed by remote processing devices that are linked through a communications network. In a distributed computing environment, program modules can be located in both local and remote memory storage devices.

A computer typically includes a variety of computer-readable media. Computer-readable media can be any available media that can be accessed by the computer and includes both volatile and nonvolatile media, removable and non-removable media. By way of example, and not limitation, computer-

readable media can comprise computer storage media and communication media. Computer storage media includes volatile and nonvolatile, removable and non-removable media implemented in any method or technology for storage of information such as computer-readable instructions, data structures, program modules or other data. Computer storage media includes, but is not limited to, RAM, ROM, EEPROM, flash memory or other memory technology, CD-ROM, digital versatile disk (DVD) or other optical disk storage, magnetic cassettes, magnetic tape, magnetic disk storage or other magnetic storage devices, or any other medium which can be used to store the desired information and which can be accessed by the computer.

Communication media typically embodies computer-readable instructions, data structures, program modules or other data in a modulated data signal such as a carrier wave or other transport mechanism, and includes any information delivery media. The term "modulated data signal" means a signal that has one or more of its characteristics set or changed in such a manner as to encode information in the signal. By way of example, and not limitation, communication media includes wired media such as a wired network or direct-wired connection, and wireless media such as acoustic, RF, infrared and other wireless media. Combinations of the any of the above should also be included within the scope of computer-readable media.

With reference again to FIG. **10**, the example environment **1000** for implementing various aspects of the specification includes a computer **1002**, the computer **1002** including a processing unit **1004**, a system memory **1006** and a system bus **1008**. The system bus **1008** couples system components including, but not limited to, the system memory **1006** to the processing unit **1004**. The processing unit **1004** can be any of various commercially available processors. Dual microprocessors and other multi-processor architectures can also be employed as the processing unit **1004**.

The system bus **1008** can be any of several types of bus structure that can further interconnect to a memory bus (with or without a memory controller), a peripheral bus, and a local bus using any of a variety of commercially available bus architectures. The system memory **1006** includes read-only memory (ROM) **1010** and random access memory (RAM) **1012**. A basic input/output system (BIOS) is stored in a non-volatile memory **1010** such as ROM, EPROM, EEPROM, which BIOS contains the basic routines that help to transfer information between elements within the computer **1002**, such as during start-up. The RAM **1012** can also include a high-speed RAM such as static RAM for caching data.

The computer **1002** further includes an internal hard disk drive (HDD) **1014** (e.g., EIDE, SATA), which internal hard disk drive **1014** can also be configured for external use in a suitable chassis (not shown), a magnetic floppy disk drive (FDD) **1016**, (e.g., to read from or write to a removable diskette **1018**) and an optical disk drive **1020**, (e.g., reading a CD-ROM disk **1022** or, to read from or write to other high capacity optical media such as the DVD). The hard disk drive **1014**, magnetic disk drive **1016** and optical disk drive **1020** can be connected to the system bus **1008** by a hard disk drive interface **1024**, a magnetic disk drive interface **1026** and an optical drive interface **1028**, respectively. The interface **1024** for external drive implementations includes at least one or both of Universal Serial Bus (USB) and IEEE 1394 interface technologies. Other external drive connection technologies are within contemplation of the subject specification.

The drives and their associated computer-readable media provide nonvolatile storage of data, data structures, computer-executable instructions, and so forth. For the computer **1002**, the drives and media accommodate the storage of any data in a suitable digital format. Although the description of computer-readable media above refers to a HDD, a removable magnetic diskette, and a removable optical media such as a CD or DVD, it should be appreciated by those skilled in the art that other types of media which are readable by a computer, such as zip drives, magnetic cassettes, flash memory cards, cartridges, and the like, can also be used in the example operating environment, and further, that any such media can contain computer-executable instructions for performing the methods of the specification.

A number of program modules can be stored in the drives and RAM **1012**, including an operating system **1030**, one or more application programs **1032**, other program modules **1034** and program data **1036**. All or portions of the operating system, applications, modules, and/or data can also be cached in the RAM **1012**. It is appreciated that the specification can be implemented with various commercially available operating systems or combinations of operating systems.

A user can enter commands and information into the computer **1002** through one or more wired/wireless input devices, e.g., a keyboard **1038** and a pointing device, such as a mouse **1040**. Other input devices (not shown) can include a microphone, an IR remote control, a joystick, a game pad, a stylus pen, touch screen, or the like. These and other input devices are often connected to the processing unit **1004** through an input device interface **1042** that is coupled to the system bus **1008**, but can be connected by other interfaces, such as a parallel port, an IEEE 1394 serial port, a game port, a USB port, an IR interface, etc.

A monitor **1044** or other type of display device is also connected to the system bus **1008** via an interface, such as a video adapter **1046**. In addition to the monitor **1044**, a computer typically includes other peripheral output devices (not shown), such as speakers, printers, etc.

The computer **1002** can operate in a networked environment using logical connections via wired and/or wireless communications to one or more remote computers, such as a remote computer(s) **1048**. The remote computer(s) **1048** can be a workstation, a server computer, a router, a personal computer, portable computer, microprocessor-based entertainment appliance, a peer device or other common network node, and typically includes many or all of the elements described relative to the computer **1002**, although, for purposes of brevity, only a memory/storage device **1050** is illustrated. The logical connections depicted include wired/wireless connectivity to a local area network (LAN) **1052** and/or larger networks, e.g., a wide area network (WAN) **1054**. Such LAN and WAN networking environments are commonplace in offices and companies, and facilitate enterprise-wide computer networks, such as intranets, all of which can connect to a global communications network, e.g., the Internet.

When used in a LAN networking environment, the computer **1002** is connected to the local network **1052** through a wired and/or wireless communication network interface or adapter **1056**. The adapter **1056** can facilitate wired or wireless communication to the LAN **1052**, which can also include a wireless access point disposed thereon for communicating with the wireless adapter **1056**.

When used in a WAN networking environment, the computer **1002** can include a modem **1058**, or is connected to a communications server on the WAN **1054**, or has other means for establishing communications over the WAN **1054**, such as by way of the Internet. The modem **1058**, which can be internal or external and a wired or wireless device, is connected to the system bus **1008** via the serial port interface **1042**. In a networked environment, program modules

depicted relative to the computer **1002**, or portions thereof, can be stored in the remote memory/storage device **1050**. It will be appreciated that the network connections shown are example and other means of establishing a communications link between the computers can be used.

The computer **1002** is operable to communicate with any wireless devices or entities operatively disposed in wireless communication, e.g., a printer, scanner, desktop and/or portable computer, portable data assistant, communications satellite, any piece of equipment or location associated with a wirelessly detectable tag (e.g., a kiosk, news stand, restroom), and telephone. This includes at least Wi-Fi and Bluetooth™ wireless technologies. Thus, the communication can be a predefined structure as with a conventional network or simply an ad hoc communication between at least two devices.

Wi-Fi, or Wireless Fidelity, allows connection to the Internet from a couch at home, a bed in a hotel room, or a conference room at work, without wires. Wi-Fi is a wireless technology similar to that used in a cell phone that enables such devices, e.g., computers, to send and receive data indoors and out; anywhere within the range of a base station. Wi-Fi networks use radio technologies called IEEE 802.11 (a, b, g, etc.) to provide secure, reliable, fast wireless connectivity. A Wi-Fi network can be used to connect computers to each other, to the Internet, and to wired networks (which use IEEE 802.3 or Ethernet). Wi-Fi networks operate in the unlicensed 2.4 and 5 GHz radio bands, at an 11 Mbps (802.11a) or 54 Mbps (802.11b) data rate, for example, or with products that contain both bands (dual band), so the networks can provide real-world performance similar to the basic 10BaseT wired Ethernet networks used in many offices.

The aforementioned systems have been described with respect to interaction among several components. It should be appreciated that such systems and components can include those components or sub-components specified therein, some of the specified components or sub-components, and/or additional components. Sub-components can also be implemented as components communicatively coupled to other components rather than included within parent components. Additionally, it should be noted that one or more components could be combined into a single component providing aggregate functionality. The components could also interact with one or more other components not specifically described herein but known by those of skill in the art.

What has been described above includes examples of the subject specification. It is, of course, not possible to describe every conceivable combination of components or methodologies for purposes of describing the subject specification, but one of ordinary skill in the art can recognize that many further combinations and permutations of the subject specification are possible. Accordingly, the subject specification is intended to embrace all such alterations, modifications and variations that fall within the spirit and scope of the appended claims. Furthermore, to the extent that the term "includes" is used in either the detailed description or the claims, such term is intended to be inclusive in a manner similar to the term "comprising" as "comprising" is interpreted when employed as a transitional word in a claim.

What is claimed is:

1. Computer storage media having embodied thereon computer-useable instructions that, when executed, implement a system, the system comprising:

a search component that locates at least one information source, retains pedestrian history from a plurality of pedestrians and addresses of at least one information source that has a history of providing reliable information, identifies low quality information sources that do not provide information used in route generation, and blocks information obtainment for the low quality information sources;

a gather component that obtains information related to pedestrian travel including security information, weather information, and terrain information, wherein the gather component obtains the information from the at least one located information source;

an artificial intelligence component that makes at least one inference regarding a route based on a previous pedestrian behavior;

a filter component that determines, based on the at least one inference, the information that is likely relevant and deletes information that is commonly of little value in part through examination of previously produced routes;

an analysis component that determines an importance of the information to a user, estimates how likely the information is to change, and chooses if the user should reach a destination through a pedestrian route and/or through a conventional route;

a generation component that obtains the information from the gather component and produces a direction set for use by a pedestrian based at least part upon the obtained information; and

a resolution component that resolves a conflict between an information source with a financial interest and an information source without a financial interest and instructs the generation component to produce the direction set based upon the information source that does not have a financial interest in providing the direction set.

2. The system of claim **1**, wherein a substantial portion of the direction set takes a user along a route that is not maneuverable by an automobile.

3. The system of claim **1**, further comprising a disclosure component that provides the direction set to the pedestrian.

4. The system of claim **3**, further comprising a metadata component that modifies information provided with the direction set based upon contextual information, pedestrian request, pedestrian history, or a combination thereof, the contextual information, pedestrian request, pedestrian history, or a combination thereof is obtained by the gather component, the disclosure component provides the direction set with modified information to the pedestrian.

5. The system of claim **1**, further comprising a transaction component that performs a reward operation in relation to information obtainment or direction set production, wherein the reward operation rewards the pedestrian, an advertisement hosting service, a provider, or any combination thereof.

6. The system of claim **1**, further comprising an advertisement component that integrates a commercial detail with a direction set.

7. Computer storage media having embodied thereon computer-useable instructions that, when executed, perform a method, the method comprising:

collecting a request from a pedestrian that a route includes a waypoint to a general location;

locating at least one information source, retaining pedestrian history from a plurality of pedestrians and addresses of at least one information source that has a history of providing reliable information, identifying low quality information sources that do not provide information used in route generation, and blocking information obtainment for the low quality information sources;

obtaining information related to pedestrian travel including security information, weather information, and ter-

rain information, wherein the gather component obtains the information from the at least one located information source;

making at least one inference regarding a route based on a previous pedestrian behavior;

determining, based on the at least one inference, the information that is likely relevant and deleting information that is commonly of little value in part through examination of previously produced routes;

determining an importance of the information to a user, estimating how likely the information is to change, and choosing if the user should reach the destination through pedestrian route and/or through a conventional route;

resolving conflicts between an information source with a financial interest and an information source without a financial interest and producing a direction set based upon the information source that does not have a financial interest in providing the direction set;

collecting information concerning routes of other people; and

using the collected information to update the pedestrian-based route in real time.

8. The method of claim **7**, wherein a considerable portion of the route takes the pedestrian along at least one path that is not maneuverable by an automobile.

9. The method of claim **7**, further comprising evaluating the request from a pedestrian that a route include a waypoint to a general location.

10. The method of claim **7**, further comprising establishing at least one specific location.

11. The method of claim **10**, further comprising choosing at least one specific location for inclusion in the pedestrian based route from at least one established specific location.

12. The method of claim **7**, further comprising analyzing at least one available path, at least one analyzed path is at least part of the pedestrian-based route and takes the user to the specific location.

13. The system of claim **1**, further comprising an interaction component for collecting information concerning routes of other people and using the route information to update the direction set in real-time.

14. The system of claim **1**, wherein the direction set includes a portion where a user travels in a natural manner and a portion where the user travels as a passenger.

15. The system of claim **14**, wherein at least part of the portion where the user travels as a passenger employs the user being a passenger upon public transportation.

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